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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,710	01/16/2004	Martin W. Rupich	02802.174 US1 AMSC-676	6546
83174 WilmerHale 60 State Street Boston, MA 02109	7590 08/18/2009		EXAMINER WARTALOWICZ, PAUL A	
			ART UNIT 1793	PAPER NUMBER
			MAIL DATE 08/18/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/758,710

**Applicant(s)**

RUPICH ET AL.

**Examiner**

PAUL A. WARTALOWICZ

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 9-18, 70 and 71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-18, 70 and 71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 4/22/09 have been fully considered but they are not persuasive.

Applicant argues that Jin fails to produce flux pinning sites by using a significantly different method (grinding, etc.) than the claimed invention.

However, Jin does suggest that producing pinning sites using a precipitation method would be better than producing pinning sites using the method of grinding. Therefore, it appears that Jin teaches away from using a grinding method of forming pinning centers, but suggests using a precipitation method for substitution of rare earth elements in a superconductor (page 78).

Applicant points out that Jin suggests that future efforts should perhaps by concentrated on Ba-, Cu-, or O-site substitutions.

However, it appears that Jin suggests using a precipitation method for substitution of rare earth elements in a superconductor (page 78) and to substitute Ba, Cu, or O elements in the superconductor with other elements. These two teachings in Jin do not appear to be mutually exclusive.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-17 recite the limitation "the film" in line 1. There is insufficient antecedent basis for this limitation in the claim.

For the purposes of further examination, "the film" is being interpreted as --the intermediate film--.

Clarification and/or correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, 9-18, 70, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Weinstein (U.S. 6869915) and Jin (Superconducting properties of...).

Riley teach a process of disposing a precursor solution onto a biaxially textured substrate (page 7) to form a precursor film wherein the precursor components comprise an organic solution of metal trifluoroacetates prepared from powders of salts of barium, yttrium, and copper wherein after application, the precursor is heat treated to a temperature of 300-500°C (page 19) at a rate of at least 5°C per minute (page 22)

wherein the intermediate film is heated at a temperature of 700-825°C in the claimed environment (page 22).

Riley fail to teach that a dopant comprising a metal compound is in the precursor solution that is capable of replacing one or more of the rare earth and alkaline earth metal of the rare-earth/alkaline-earth/transition metal oxide.

Jin teach a method of making superconductors (page 75) wherein 20% of yttrium is substituted with a second rare earth element (holmium is a second rare earth element used for substitution of yttrium, page 76, 78) for the purpose of raising the  $J_c$  (page 78).

Jin further suggests that forming pinning centers in superconductors using a precipitation reaction is desirable because the precipitation reaction is less likely to interfere with sintering, texturing and wire fabrication (page 78).

Weinstein teaches a method of making YBCO superconductors having pinning centers (col. 4) wherein elements to be substituted for elements in the superconductor are added during a precipitation reaction forming an oxyfluoride intermediate for the purpose of dispersing the elements into a matrix formed by the HTS material (col. 11).

As Jin teaches that a rare earth element is partially substituted with another rare earth element and suggests that forming pinning centers in superconductors using a precipitation reaction is desirable because the precipitation reaction is less likely to interfere with sintering, texturing and wire fabrication, and because Weinstein teaches that elements to be substituted for elements in the superconductor are added during a precipitation reaction forming an oxyfluoride intermediate for the purpose of dispersing the elements into a matrix formed by the HTS material (col. 11), it would have been

obvious to one of ordinary skill in the art at the time applicant's invention was made to add a rare earth element to a precipitation reaction that partially substitutes a rare earth element in the superconductor of Riley.

Regarding claims 12-17, Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water during the heating of the intermediate oxyfluoride film (page 20).

Additionally, the claimed heat ramps could be discovered through routine experimentation.

As Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water (page 20) and because the claimed heat ramps could be discovered through routine experimentation, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a heating ramp of greater than 200°C per minute during the heat treatment of the oxyfluoride intermediate film of Riley.

In the alternative, Weinstein teaches a process for producing a superconductor wherein a precursor is heated to form an oxyfluoride intermediate film, where after the intermediate film is heated at a temperature less than 810°C (col. 11).

As Weinstein teaches a the intermediate film is heated at a temperature less than 810°C (col. 11), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to heat the intermediate oxyfluoride film of Riley at a temperature less than 810°C (col. 11).

While Weinstein does not explicitly disclose that the intermediate film is heated instantaneously, Weinstein does recite that "the coating is heated...at a temperature of

less than 810°C" (emphasis added, col. 11, lines 25-30). As this disclosure in Weinstein recites "at" a temperature rather than "to a" temperature, it appears that Weinstein teaches an instantaneous heating or a heating ramp that overlaps the claimed heating ramp.

Regarding claims 4 and 5, Weinstein teach that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6).

As Weinstein teaches that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute an element in the superconductor of Riley with an element present in the amount of 0.01-1% of the entire material.

This range appears to overlap with the range in claims 4 and 5.

Regarding claim 18, the prior art teach a substantially similar process as that instantly claimed such that the properties resulting from the prior art process are substantially similar to those instantly claimed, including orientation.

Regarding claim 71, Jin suggests that barium in YBCO should be substituted with another element (page 78).

As Jin suggests that barium in YBCO should be substituted (page 78), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute the barium in the YBCO of Riley with another element.

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Weinstein (U.S. 6869915) and Jin (Superconducting properties of...) and Wiesmann et al. (US 2003/0050195).

Riley teaches a method of making a superconductor as described above in claim 1.

If Riley fails to teach that the intermediate film is heated at a temperature ramp of about greater than 25°C per minute, Wiesmann, however, teaches a method of making superconductors [0002] wherein a precursor film comprising Ba, Y, Cu, and F is heated from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in order to form a YBCO superconductor [0050].

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide heating a precursor film from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in Riley in order to form a YBCO superconductor [0050] as taught by Wiesmann.

It appears that the value of 25 overlaps with the recitation of "greater than about 25".

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for



concentrations slightly above 5% thus the ranges overlapped.); In re Geisler, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997). MPEP 2144.05 (I).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of any one of Weinstein (U.S. 6869915) and Jin (Superconducting properties of...) and Feenstra (U.S. 5972847).

Riley teaches a process for making a superconductor as described above.

If Riley fails to teach that the oxide superconductor is biaxially oriented and that the oxide superconductor has a c-axis orientation that is substantially constant across its width, the c-axis orientation of the oxide superconductor being substantially perpendicular to the surface of the substrate, Feenstra teaches a method for making superconductors (col. 1) wherein it is known that biaxial texture is required to obtain high transport critical current densities (col. 1). Also taught is that the most favorable YBCO orientation is with c-axis perpendicular to the substrate (col. 4).

Riley teaches that a-axis oriented grains should be minimized (page 27).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide biaxial textured superconductors and c-axis perpendicular to the substrate in Riley for the purpose of obtaining high transport critical current densities the most favorable YBCO orientation is with c-axis perpendicular to the substrate as taught by Feenstra. Additionally, one would be motivated to provide c-axis orientation constant as Riley teaches that a-axis oriented grains should be minimized.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz  
August 11, 2009

/Stanley Silverman/  
Supervisory Patent Examiner, AU 1793